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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Jong Sik Paek

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01/04/2005

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EXAMINER

LEWIS, MONICA

ART UNIT

PAPER NUMBER

2822

DATE MAILED: 01/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/043,946

Applicant(s)

PAEK, JONG SIK

Examiner

Monica Lewis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 October 2004.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9, 11 and 19-24 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-9, 11 and 19-24 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 11 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

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DETAILED ACTION

1. This action is in response to the appeal brief filed October 15, 2004.
2. The finality of the rejection of the last Office action is withdrawn.

Response to Arguments

3. Applicant's arguments with respect to claims 1-9, 11 and 19-24 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC-§ 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-6, 9, 11 and 19-24 are rejected under 35 U.S.C. 103(a) as obvious over Huang et al. (U.S. Patent No. 6,198,171) in view of Abe (U.S. Patent No. 6,410,979).

In regards to claim 1, Huang et al. ("Huang") discloses the following:

- a) a plurality of leads (326) (For Example: See Figure 7);
- b) first surface (330) (For Example: See Figure 7);
- c) second surface (328a) disposed in opposed relation to the first surface (For Example: See Figure 7);
- d) a third surface (328b) disposed in opposed relation to the second surface, the first surface being oriented between the second and third surfaces (For Example: See Figure 7);
- e) a first semiconductor die (304) defining opposed first and second surfaces and including a plurality of bond pads (308) disposed on the first surface thereof, (For Example: See Figure 7);

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f) the first semiconductor die and bond pads of the first semiconductor die are located between a respective pair of the leads so that the bond pads of the first semiconductor die do not contact the second surface of any one of the leads (For Example: See Figure 7);

g) a second semiconductor die (310) defining opposed first and second surfaces and including a plurality of bond pads (314) disposed on the second surface thereof, the first surface of the second semiconductor die being attached to the second surface of the first semiconductor die (For Example: See Figure 7);

h) a plurality of conductive connectors (316) electrically connecting the bond pads of the first and second semiconductor dies to respective ones of the leads (For Example: See Figure 7); and

i) an encapsulating portion (332) applied to and at least partially encapsulating the leads, the first and second semiconductor dies, and the conductive connectors (For Example: See Figure 7).

In regards to claim 1, Huang fails to disclose the following:

a) portions of the first surface directly attached to the second surface of each of the leads.

However, Abe discloses portions of the die (14) attached to the leads (10) (For Example: See Figure 2). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Huang to include portions of the die attached to the leads as disclosed in Abe because it aids in providing a more direct means of attaching the die to the leads via an adhesive (For Example: See Figure 2 and Column 2 Lines 47-50).

Additionally, since Huang and Abe are both from the same field of endeavor, the purpose disclosed by Abe would have been recognized in the pertinent art of Huang.

In regards to claim 2, Huang discloses the following:

a) conductive connectors comprise conductive wires (For Example: See Figure 7).

In regards to claim 3, Huang discloses the following:

- a) the conductive wires comprise first and second conductive wires (For Example: See Figure 7);
- b) the bond pads of the first semiconductor die are electrically connected to respective ones of the first surfaces of the leads by first conductive wires (For Example: See Figure 7);
- c) the bond pads of the second semiconductor die are electrically connected to respective ones of the second surfaces of the leads by respective ones of the second conductive wires (For Example: See Figure 7).

In regards to claim 4, Huang discloses the following:

- a) a die paddle defining opposed top and bottom surfaces, the leads being disposed about the die paddle (For Example: See Figure 7); and
- b) the first surface of the first semiconductor die further being attached to the top surface of the die paddle (For Example: See Figure 7).

In regards to claim 5, Huang discloses the following:

- a) the first surface of the first semiconductor die is attached to the second surface of each of the leads and to the top surface of the die paddle by a first bonding means (322) (For Example: See Figure 7); and
- b) the first surface of the second semiconductor die is attached to the second surface of the first semiconductor die by a second bonding means (324) (For Example: See Figure 7).

In regards to claim 6, Huang discloses the following:

- a) the die paddle is formed to have a die paddle thickness (For Example: See Figure 7);
- b) each of the leads is formed to have a lead thickness between the second and third surfaces thereof (For Example: See Figure 7).
- c) the die paddle thickness is substantially equal to the lead thickness (For Example: See Figure 7).

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In regards to claim 9, Huang discloses the following:

a) the encapsulating portion is applied to the leads such that the third surface of each of the leads is exposed within the encapsulating portion (For Example: See Figure 7).

In regards to claim 11, Huang discloses the following:

a) the first semiconductor die defines a peripheral edge (For Example: See Figure 7);

b) the conductive connectors electrically connecting the bond pads of the first semiconductor die to the leads are oriented inwardly relative to the peripheral edge of the first semiconductor die (For Example: See Figure 7).

In regards to claim 19, Huang discloses the following:

a) a plurality of leads (For Example: See Figure 7);

b) a first semiconductor die including a plurality of bond pads disposed thereon (For Example: See Figure 7);

c) the first semiconductor die and the bond pads of the first semiconductor die are located between a respective pair of the leads so that the bond pads of the first semiconductor die do not contact the second surface of any one of the leads (For Example: See Figure 7);

d) a second semiconductor die including a plurality of bond pads disposed thereon, the second semiconductor die being attached to the first semiconductor die (For Example: See Figure 7);

e) electrically connecting the bond pads of the first and second semiconductor dies to respective ones of the leads (For Example: See Figure 7); and

f) an encapsulating portion applied to and at least partially encapsulating the leads, the first and second semiconductor dies, and the electrical connection means (For Example: See Figure 7).

In regards to claim 19, Huang fails to disclose the following:

a) the first surface semiconductor die being directly attached to each of the leads.

However, Abe discloses portions of the die (14) attached to the leads (10) (For Example: See Figure 2). It would have been obvious to one having ordinary skill in the art at the time the

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invention was made to modify the semiconductor device of Huang to include portions of the die attached to the leads as disclosed in Abe because it aids in providing a more direct means of attaching the die to the leads via an adhesive (For Example: See Figure 2 and Column 2 Lines 47-50).

Additionally, since Huang and Abe are both from the same field of endeavor, the purpose disclosed by Abe would have been recognized in the pertinent art of Huang.

In regards to claim 20, Huang discloses the following:

a) the electrical connection means comprises conductive wires (For Example: See Figure 7).

In regards to claim 21, Huang discloses the following:

a) each of the leads defines opposed first (330) and second surfaces (328a) and a third surface (328b) which is opposed to the second surface, the first surface being oriented between the second and third surfaces (For Example: See Figure 7);

b) the bond pads of the first semiconductor die are electrically connected to respective ones of the first surfaces of the leads by respective ones of first conductive wires (For Example: See Figure 7); and

c) the bond pads of the second semiconductor die are electrically connected to respective ones of the second surfaces of the leads by respective ones of second conductive wires (For Example: See Figure 7).

In regards to claim 22, Huang discloses the following:

a) the encapsulating portion is applied to the leads such that the third surface of each of the leads is exposed within the encapsulating portion (For Example: See Figure 7).

In regards to claim 23, Huang discloses the following:

a) a die paddle, the leads being disposed about the die paddle (For Example: See Figure 7); and

b) the first semiconductor die being attached to the die paddle (For Example: See Figure 7).

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In regards to claim 24, Huang discloses the following:

a) the die paddle defines opposed top and bottom surfaces, with the first semiconductor die being attached to the top surface of the die paddle (For Example: See Figure 7).

6. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as obvious over Huang et al. (U.S. Patent No. 6,198,171) in view of Abe (U.S. Patent No. 6,410,979) and Song (Korean Publication No. 2002049944).

In regards to claim 7, Huang discloses the following:

a) encapsulating portion (For Example: See Figure 7).

In regards to claim 7, Huang fails to disclose the following:

a) the bottom surface of the die paddle is exposed.

However, Song discloses a die paddle that has a bottom surface that is exposed (For Example: See Figure 3). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Huang to include a die paddle that has a bottom surface that is exposed as disclosed in Song because it aids in providing a simplified fabricating process (For Example: See Abstract).

Additionally, since Huang and Song are both from the same field of endeavor, the purpose disclosed by Song would have been recognized in the pertinent art of Huang.

In regards to claim 8, Huang discloses the following:

a) encapsulating portion is applied to the leads such that the third surface of each of the leads is exposed within the encapsulating portion (For Example: See Figure 7).

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Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monica Lewis whose telephone number is 571-272-1838. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 571-272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-308-7722 for regular and after final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.



Mary Wilczewski
Primary Examiner

ML
December 22, 2004